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L11: Entry 57 of 86 File: USPT Sep 21, 1982

US-PAT-NO: 4350897
DOCUMENT-IDENTIFIER: US 4350897 A

TITLE: Lighter than air wind energy conversion system

DATE-ISSUED: September 21, 1982

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
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US-CL-CURRENT: 290/55; 244/33, 290/44, 416/85

CLAIMS:

I claim as my invention:

1. Apparatus, which comprises:

a lighter than air structure;

means supported by said lighter than air structure for generating electricity, said means including a main rotor adapted to be rotated by the wind, a turbine in fluid communication with said main rotor, and an electrical generator coupled to said turbine; and

means connected between said lighter than air structure and the ground for tethering said structure and for delivering electricity from said generator.

2. The apparatus as set forth in claim 1, wherein said main rotor includes a hollow rotor blade having an air inlet and an air outlet.

3. The apparatus as set forth in claim 2, further comprising duct means for coupling said air inlet of said hollow rotor blade to said turbine.

4. The apparatus as set forth in claim 3, wherein said turbine is positioned within said duct means.

5. The apparatus as set forth in claim 4, wherein said duct means includes an open front end and a rear end, said air inlet of said hollow rotor blade coupled to said rear end, said hollow rotor blade adapted, upon rotation thereof, to draw air through said open front end.

6. The apparatus as set forth in claim 5, wherein said turbine includes impeller blade means adapted to be rotated by the air drawn through said open front end of said duct means.

7. The apparatus as set forth in claim 6, wherein said electrical generator is positioned forwardly of said turbine.

8. The apparatus as set forth in claim 6, wherein said electrical generator is positioned rearwardly of said turbine within said duct means.

9. The apparatus as set forth in claim 6, wherein said duct means comprises a substantially linear duct from said front end to said rear end thereof.

10. The apparatus as set forth in claims 3, 5 or 9, wherein said duct is positioned within said lighter than air structure substantially along the longitudinal axis of said structure.

11. The apparatus as set forth in claim 10, wherein said open front end of said duct comprises a ram air inlet.

12. The apparatus as set forth in claims 3, 5 or 9, wherein said duct is positioned externally of said lighter than air structure, and further comprising means for connecting said duct to said structure.

13. The apparatus as set forth in claims 1, 6 or 9, wherein said main rotor is connected to the rear of said lighter than air structure and rotates in a plane which is substantially perpendicular to the longitudinal axis of said structure.

14. The apparatus as set forth in claims 1, 5 or 9, wherein said means connected between said lighter than air structure and the ground comprises at least one tethering cable means and at least one electrical cable means.

15. The apparatus as set forth in claim 14, further comprising means positioned on the ground for mooring said cable means which includes means for selectively drawing in said cable means and thereby bringing said structure closer to the ground.

16. The apparatus as set forth in claim 1[illegible], wherein said cable means includes at least two cables, one of which is connected to the fore portion of said structure, said mooring means including a beam pivotally coupled to a support pedestal and having one of said cables connected to each end thereof.

17. The apparatus as set forth in claim 16, further comprising outriggers extending laterally from said lighter than air structure to which said cables are connected.

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L11: Entry 21 of 86 File: USPT Mar 31, 1998

US-PAT-NO: 5734202
DOCUMENT-IDENTIFIER: US 5734202 A

TITLE: Method and apparatus for generating electricity utilizing a forced recirculating air tunnel

DATE-ISSUED: March 31, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
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US-CL-CURRENT: 290/55; 290/1R

CLAIMS:

What is claimed is:

1. An apparatus for generating electricity, comprising:

a housing defining a substantially enclosed and continuous, closed-loop airflow pathway with no substantial communication with ambient winds outside said housing;

at least one power consuming air propeller for propelling air within said substantially enclosed and continuous, closed-loop airflow pathway;

means for energizing said at least one power consuming air propeller;

a plurality of wind turbines located in said substantially enclosed and continuous, closed-loop airflow pathway, each including at least one propeller blade for engaging airflow within said substantially enclosed and continuous, closed-loop airflow pathway and each including a generator member for generating electricity in response to rotation of said at least one propeller blade.

2. An apparatus for generating electricity according to claim 1, wherein said housing defines an enclosed, continuous, and sealed closed-loop airflow pathway.

3. An apparatus for generating electricity according to claim 1 wherein said airflow pathway defines a particular one of the following closed-loop shapes:

(a) a circular closed-loop shape;

(b) an oval closed-loop shape;

(c) a rectangular closed-loop shape;

(d) an elliptical closed-loop shape; and

(e) a spiral closed loop shape.

4. An apparatus for generating electricity according to claim 1, wherein said at least one power consuming air propeller comprises a variable speed air propeller.

5. An apparatus for generating electricity according to claim 4 wherein said variable speed air propeller is positioned inline within said substantially enclosed and continuous airflow pathway.

6. An apparatus for generating electricity according to claim 1 wherein said at least one power consuming air propeller operates simultaneously to push air and to pull air within said substantially enclosed and continuous closed-loop airflow pathway.

7. An apparatus for generating electricity according to claim 1 wherein said at least one power consuming air propeller is utilized to maintain a particular velocity of airflow within said substantially enclosed and continuous closed-loop airflow pathway.

8. An apparatus for generating electricity according to claim 7, wherein said particular velocity is obtained at a particular air temperature by maintaining a particular propeller speed for said at least one power consuming air propeller.

9. An apparatus for generating electricity according to claim 7, further including at least one of the following:

(a) at least one venturi tube communicating with said, substantially enclosed and continuous, closed-loop airflow pathway;

(b) at least one reduced diameter portion of said substantially enclosed and continuous, closed-loop airflow pathway;

(c) means for controlling air density within said substantially enclosed and continuous, closed-loop airflow pathway; and

(d) means for controlling air humidity within said substantially enclosed and continuous, closed-loop airflow pathway;

which can be utilized to maintain said particular velocity.

10. An apparatus for generating electricity according to claim 1, wherein said means for energizing comprises at least one electric motor.

11. An apparatus for generating electricity according to claim 1, wherein said means for energizing comprises at least one solar powered electrical motor.

12. An apparatus for generating electricity according to claim 11, wherein said means for energizing further includes at least one of the following:

(a) an electric motor; and

(b) an internal combustion engine.

13. An apparatus for generating electricity according to claim 1, wherein said at least one propeller blade of each of said plurality of wind turbines is located entirely within said substantially enclosed and continuous, closed-loop airflow pathway.

14. An apparatus for generating electricity according to claim 13, wherein said at least one propeller blade of each of said plurality of wind turbines is positioned transverse to said airflow pathway.

15. An apparatus for generating electricity according to claim 1, further including:

at least one maintenance porthole which allows removal of at least a particular one of said plurality of wind turbines for repair.

16. A method of generating electricity, comprising the method steps of:

providing a housing defining a substantially enclosed and continuous, closed-loop airflow pathway which has no substantial communication with ambient wind outside said housing;

locating at least one power consuming air propeller therein for propelling air within said substantially enclosed and continuous, closed-loop airflow pathway;

energizing at least one power consuming air propeller to cause air to flow about said enclosed and continuous, closed-loop airflow pathway;

locating a plurality of wind turbines in said substantially enclosed and continuous

closed-loop airflow pathway, each including at least one propeller blade for engaging airflow within said substantially enclosed and continuous closed-loop airflow pathway and each including a generator member of generating electricity in response to rotation of said at least one propeller blade; and

utilizing said plurality of wind turbines to generate electricity.

17. A method of generating electricity according to claim 16 wherein said at least one power consuming air propeller operates simultaneously to push air and to pull air within said substantially enclosed and continuous, closed-loop airflow pathway.

18. A method of generating electricity according to claim 16 wherein said at least one power consuming air propeller is utilized to maintain a particular velocity of airflow within said substantially enclosed and continuous, closed-loop airflow pathway.

19. A method of generating electricity according to claim 18, wherein said particular velocity is obtained at a particular air temperature by maintaining a particular propeller speed for said at least one power consuming air propeller.

20. A method of generating electricity according to claim 7, further including at least one of the following:

(a) at least one venturi tube communicating with said, substantially enclosed and continuous, closed-loop airflow pathway;

(b) at least one reduced diameter portion of said substantially enclosed and continuous, closed-loop airflow pathway;

(c) means for controlling air density within said substantially enclosed and continuous, closed-loop airflow pathway; and

(d) means for controlling air humidity within said substantially enclosed and continuous, closed-loop airflow pathway;

which can be utilized to maintain said particular velocity.

21. A method of generating electricity according to claim 16, wherein said at least one propeller blade of each of said plurality of wind turbines is located entirely within said substantially enclosed and continuous, closed-loop airflow pathway.

22. A method of generating electricity according to claim 21, wherein said at least one propeller blade of each of said plurality of wind turbines is positioned transverse to said airflow pathway.